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Running Title: EATING BEHAVIORS AND ETHNICITY

Eating Behaviors and Obesity in African American and Caucasian Women

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Abstract

Objective: Few studies have examined racial/ethnic differences in eating behaviors in relation to obesity. We therefore studied overweight African American and Caucasian women with emotional eating to detect factors associated with obesity using multiple linear regression (MLR) and signal detection analysis (SDA). **Setting:** Participants were recruited from the greater Washington, D.C. area. **Participants:** Ninety-eight female adults (46% African American, 54% Caucasian) with self-reported emotional eating completed measures of eating-related cognitions and behaviors. **Main Outcome Measures:** Body mass index (BMI; kg/m^2) and body fat percentage. **Results:** African Americans had higher BMI and more body fat than Caucasian women but significantly lower levels of disinhibition of control over eating. Dietary restraint was not different between groups. MLR revealed being African American and reporting high disinhibition were associated with increases in both outcome variables, while high dietary restraint was associated with reduced BMI and body fat percentage. Signal detection results revealed that all African American women but only Caucasian women over the age of 29.3 were at significantly increased obesity risk. **Conclusions:** Our findings highlight the utility of SDA in obesity risk factor detection and suggest a universal need for obesity prevention among Caucasian and African American women. Findings stress the importance of early-onset weight loss and weight management interventions for African American females.

Key Words: Dietary restraint, disinhibition, obesity, overweight, body mass index, ethnicity, African American

Introduction

Over 50% of African American women are obese compared to 30% of Caucasian American women [1]. Obesity puts individuals at risk for several health problems such as diabetes, hypertension, and cardiovascular disease [2]. Factors that contribute to weight gain are individual and complex; however, eating behaviors play a significant role in the promotion of excess weight [3]. Among women, a large percentage of overweight individuals describe eating in the absence of hunger, often in response to a broad range of emotions [4]. Eating in this context is associated with increased intake of high sugar and high fat foods [5], and a relationship between affective eating and depressive symptoms [6] has been found in Caucasian females. Cultural dietary practices, body weight ideals, and dieting behaviors have been compared among African American and Caucasian samples; however, the identification of patterns of eating that are associated with obesity risk among African American women remains poorly understood.

There is a positive association between eating behaviors such as disinhibition of control over eating and body mass index (BMI; kg/m^2), in primarily Caucasian samples [7, 8]. African American college [9] and community [10, 11] women report less disinhibition, dietary restraint, and awareness of hunger than Caucasians. It is not clear if the relationships between eating behaviors and obesity that exist among Caucasian women are similar across African American samples or if additional variables play a larger role in obesity risk.

A wealth of research regarding ideals of thinness and beauty standards among Caucasian and African American women indicates that factors such as body image, cultural acceptance of body weight, and disordered eating vary by ethnicity. Greater

acceptance of overweight body sizes or an underestimation of one's body shape by African American women are also posited to play a role in the growing body weight disparity between African American and Caucasian women [12]. The stringent weight and beauty ideals Caucasian women set for themselves partially explain eating behavior patterns seen among this population [13]; however, the contrasting and generally more lenient standards and ideals that are held among the majority of African American women may suggest less disordered eating patterns [14]. Research findings remain inconclusive as to the relationship between weight status and body dissatisfaction among African American and Caucasian women. There is a relationship between excess weight and body dissatisfaction among Caucasian compared to African American college students [15]; however, African American subsamples including postpartum [16], diabetic [17], and healthy [18] women suggest that community samples of African American women demonstrate body dissatisfaction as body weight increases. Elucidating the relationship between obesity risk and contributing factors that are inextricably interconnected with eating patterns is needed to improve weight management interventions for diverse populations.

Identification of differences in patterns of eating between African American and Caucasian women that may infer risk for the development and/or maintenance of obesity is critical. One tool that may help determine these individual differences is signal detection analysis (SDA). SDA is a statistical tool that locates the optimal value of predictor variables associated with a binary outcome. SDA identifies values (cutpoints) in predictor variables at which risk for an outcome significantly increases within a specific subgroup. When applied to the analysis of eating behaviors, results may potentially guide

the implementation of behavioral interventions for treatment-seeking women of different backgrounds. The more commonly employed regression-based approaches yield only the relative degree of impact each variable in a model has on a given outcome. Thus, SDA may be more useful than regression-based approaches for planning specialized programs for individuals at high-risk [19].

The present study used SDA to detect factors associated with obesity among overweight and obese African American and Caucasian women who participated in a study on emotional eating [20]. Despite differences between eating patterns and BMI among African American and Caucasian women, information used to guide behavioral weight management interventions utilize assumptions made about the relationship between eating patterns and BMI concluded from primarily Caucasian samples. To our knowledge this study is the first to examine the relationship between emotional responses to eating and risk for obesity in an ethnically diverse population using SDA. Given the lack of data on ethnic differences in eating patterns in affective eaters, the first aim of this study was to investigate differences in eating behaviors among overweight Caucasian and African American women and to determine the relationship between eating behaviors, BMI and body fat in each ethnic group. It was hypothesized based on previous findings among samples of African American and Caucasian women that African American affective eaters would exhibit higher BMI and body fat percentages than Caucasians. Additionally, it was anticipated that African American women would report less pathological eating attitudes and behavior patterns, based on reports of lower scores on measures of eating and weight attitudes among African American compared to Caucasian samples. This may indicate the relationship between overall eating disturbance and body

weight is less pronounced in African American women. The second aim of this study was to use multiple linear regression (MLR) to investigate the relationship between ethnicity, eating behaviors and demographic variables with BMI and body fat. Ethnicity was hypothesized to be the greatest predictor of both measures of weight status after controlling for demographic variables and eating behaviors. Disinhibition has been shown to be associated with increased BMI in Caucasian samples and was anticipated to be the most useful eating behavior to predict BMI and body fat among both African American and Caucasian women. Signal detection methodology was then employed as a means of hypothesis-generation to determine the most significant predictors of obesity in the present sample and the results of MLR and SDA were compared.

Method

Participants

Participants were 98 overweight and obese African American and Caucasian women who participated in a study of responses to stress in emotional eaters. All participants self-reported a history of emotional eating. Women ranged in age from 18-61y and included 45 African Americans (45.9%) and 53 Caucasians. Participation was limited to women over the age of 18 with a BMI $\geq$ 25 kg/m^2. Exclusion criteria included self-reported history of heart disease, uncontrolled hypertension, thyroid disease, diabetes, tobacco use, mental health disorder diagnosis, anti-depressant/anti-psychotic use, pregnancy. Participants were able to speak, read, and write English and provided informed consent prior to initiation of study procedures. This study was approved by the

Uniformed Services University of the Health Sciences (USUHS) Internal Review Committee.

Procedures

As part of a larger project, eligible African American and Caucasian women participated in a 1.5 hour visit to the USUHS in Bethesda, MD between September and December, 2007 in a study on emotional eating. Participants completed a packet of psychosocial questionnaires prior to experimental manipulation including the Eating Inventory (EI) [21], Emotional Eating Scale [22], Eating Disorder Diagnostic Scale [23], and the Beck Depression Inventory-II [24]. Additional measures relevant to the larger study were also collected but were not utilized in the present project. Participants were studied individually, and completed all questionnaires in a private room. A research team member was available at all times to answer questions.

Measures

Demographics

Ethnicity was self-reported by participants. Age, marital status, household income, employment and level of education were self-reported. Descriptive statistics of the sample are provided in Table 1.

Body Composition

BMI [25] was calculated from subject-reported height and objectively measured weight. Body fat percentage was assessed using a Tanita BF-350 Body Composition

Analyzer Scale, which calculated body fat percentage based on each individual's age, sex, and height using bioelectrical impedance analysis. Both BMI and body fat percentages were used as dependent variables in all analyses unless stated otherwise.

Questionnaires

The Eating Inventory (EI) [21] measures three psychological predictors of eating behavior: cognitive restraint of eating, disinhibition of control, and perceived hunger awareness. Each subscale of the EI measures a conceptually independent feature of eating behavior and the three subscales were analyzed separately according to published guidelines [21]. This 51 item questionnaire consists of 36 true/false and 15 Likert scale (4 point) items. The EI has high internal consistency for all three subscales (Cronbach's alpha = 0.79–0.93 among samples of dieters, free eaters and dieters and free eaters) [21]. The EI has been used in studies of obesity, eating disorders, and weight-related behaviors. African American women self-report lower scores than Caucasian women on all three subscales in college [9] and community [10, 11, 26, 27] samples, with significant differences between groups on the disinhibition and hunger scales. Higher scores denote greater eating pathology.

The Emotional Eating Scale [22] is a 25 item scale, with three subscales (Anger/Frustration, Anxiety, Depression), that measures tendency to cope with negative affect by eating. Desire to eat in response to a variety of emotions is evaluated via 5-point Likert scale ratings. The Emotional Eating Scale has good construct, discriminant, and criterion-related validity [22], with robust coefficient alphas of 0.78 (Anger/Frustration), 0.78 (Anxiety), and 0.72 (Depression). Mean subscale scores among obese treatment-seeking Caucasian women are 26.85 (SD = 8.71) for Anger/Frustration (range = 0-44),

16.49 (SD = 7.31) for Anxiety (range = 0-36), and 12.96 (SD = 3.62) for Depression (range = 0-20).

The Eating Disorder Diagnostic Scale [23] is a 22-item scale that is useful as a screening tool for Anorexia Nervosa, Bulimia Nervosa, and Binge Eating Disorder. Agreement between eating disorder diagnoses from the Eating Disorder Diagnostic Scale and those by clinical interview is high: 99% for Anorexia, 96% for Bulimia, and 93% for Binge Eating Disorder. There is also evidence of internal consistency across items (alpha = .89) [23].

The Beck Depression Inventory-II [24] was used to evaluate depressive symptoms. Comprised of 21 items, each item was scored 0 to 3. The test has high internal consistency (alpha = .91) [24]. Cutoffs used were: 0-13 (minimal depression); 14-19 (mild depression); 20-28 (moderate depression); and 29-63 (severe depression).

Statistical Analysis

Statistical analyses were performed with SPSS 16.0 [28]. SDA were conducted with Signal Detection Software for Receiver Operator Characteristics Version 5 [29]. Data are presented as means ± SDs. Statistical tests were two-tailed, with a p value (α level) of $< .05$. Participants who did not provide complete data on a given subscale of the EI were removed from analyses involving that subscale only, yielding n = 96, 98, and 95 for restraint, disinhibition, and hunger scales, respectively. Missing data was resolved by removal of the data point for the given analysis.

Between-group differences in the major outcome variables (BMI and body fat percentage) and demographic variables were tested for using one-way analysis of variance (ANOVA). Eating behavior and emotional eating scores between groups were

evaluated for ethnic differences. Because psychological variables, such as depression, can impact eating behaviors in overweight individuals prone to affective eating, group differences on the Beck Depression Inventory-II [24] were also examined. After completion of descriptive analyses, two MLR were conducted to determine the contributions of the variables of interest (ethnicity, restraint, disinhibition, hunger) for predicting BMI and body fat. In addition, demographic variables were controlled for to ensure the explanatory ability of ethnicity and eating behaviors on BMI and body fat was not overestimated.

SDA utilized the available demographic, psychological, and behavioral variables as predictors of the outcome of obesity (BMI $\geq$ 30). The entire sample was partitioned into two subgroups based on the most optimal predictor of the outcome in each subgroup. Each subgroup was further broken down based on the next most optimal variable from the remaining selections based on a pre-determined $\alpha < .05$ [30, 31]. Specific cutpoints across variables were chosen, resulting in the greatest discrimination between those who were obese and those who were not. This procedure was repeated for each subgroup utilizing all available (unused) predictor variables until subgroups were unable to be further broken down due to sample size limits.

Results

There were no significant differences in marital status, age, income, or employment between groups (all p's > 0.05); however, Caucasian women had significantly higher education ($F(1,96) = 6.10$, $p = 0.015$). As expected, African American women had significantly higher mean BMI, ($F(1,96) = 7.94$, $p = 0.006$) and

body fat percentage, ($F(1,96) = 7.27$, $p = 0.008$) than Caucasian women. Participants reported minimal symptoms of depression assessed by the Beck Depression Inventory-II, with no significant differences between ethnic groups. Caucasian women reported significantly higher Emotional Eating Scale Depression scores compared to African American women ($F(1,93) = 6.30$, $p = 0.014$). Diagnoses of eating disorder pathology by the Eating Disorder Diagnostic Scale revealed that only 24% of the total sample met criteria for Bulimia Nervosa or Binge Eating Disordered behavior (sub- or threshold level) with no differences by ethnicity.

Ethnic Differences in Eating-Related Cognitions and Behaviors

Results for the EI subscales by ethnicity are depicted in Table 2. Levels of restraint were not different between African American and Caucasian women ($F(1,93) = 0.26$, $p = 0.612$). There were significant differences between groups for disinhibition ($F(1,96) = 14.64$, $p = 0.000$) and hunger ($F(1,94) = 9.31$, $p = 0.003$), Caucasian women reported higher levels of both eating behaviors than African American women. These results had medium effect sizes of $d = 0.78$ and $d = 0.62$, respectively.

Amount of Variance in BMI and Body Fat Accounted for by Ethnicity and Eating Behaviors

Results from MLR analyses are presented in Table 3. The overall model for BMI ($r^2 = 0.32$ [adjusted 0.21], F (13,78) = 2.88, $p = 0.002$) and body fat ($r^2 = 0.36$ [adjusted 0.25], F (13,78) = 3.38, $p = 0.000$) were both significant. As hypothesized, ethnicity was a significant predictor of both BMI and body fat and accounted for the largest overall percentage of variance, 7.6% in BMI [6.7% adjusted] and 7.0% of body fat [6.1% adjusted]. African American ethnicity predicted significantly higher BMI ($B = 3.90$, $\beta =$

0.31, t(97) = 2.87, $p = 0.005$) and body fat ($B = 4.75$, $\beta = 0.30$, t(97) = 2.82, $p = 0.006$). When accounting for demographic variables, restraint and disinhibition also accounted for significant amounts of variance in both dependent variables. Restraint accounted for 3.5% [2.4% adjusted] of the variance in BMI ($B = -0.31$, $\beta = -0.25$, t(95) = -2.51, $p = 0.014$), and 4% [2.9% adjusted] variance in body fat ($B = -0.35$, $\beta = -0.23$, t(95) = -2.32, $p = 0.023$) and was associated with reduced BMI and body fat. Disinhibition accounted similarly for 2.3% [1.3% adjusted] of the variance in BMI ($B = 0.56$, $\beta = 0.34$, t(97) = 2.70, $p = 0.008$) and 2.8% [1.8% adjusted] variance in body fat ($B = 0.62$, $\beta = 0.30$, t(97) = 2.41, $p = 0.018$), higher disinhibition predicted increases in both dependent variables. Completion of some or all of college was a significant predictor of increased BMI ($B = 2.84$, $\beta = 0.22$, t(97) = 2.03, $p = 0.046$) compared to education above college (graduate) or below (high school). Age was a significant predictor of body fat ($B = 0.18$, $\beta = 0.26$, t(97) = 2.64, $p = 0.01$), demonstrating that body fat increases slightly with age. No other demographic variables were significant in either model.

Eating Cognitions and Obesity Risk

Overall, 52.0% of the sample was obese (BMI ≥ 30). Participants' ethnicity was the most optimally efficient variable ($p < 0.01$) that predicted a BMI ≥ 30 (χ^2 (2, n = 98) = 9.46). This first split partitioned the entire sample by ethnicity (Figure 1) and indicated for each ethnicity the percentage of the subgroup that was obese. Of the 45 African American participants in this initial subgroup, 31 (68.9%) of them were positive for the outcome of interest (i.e., were obese). Of the 53 Caucasian women, 20 of them (37.7%) were obese. Each subgroup was then split based on age, though cutpoints (i.e., years of age) for assessing likelihood of being obese differed by ethnicity. Age was only a

significant predictor of obesity risk among Caucasian women (χ^2 (2, n = 53) = 5.33, $p <$ 0.05). For Caucasian women, the age cutpoint was 29.28y. Of the 53 Caucasian women, n = 24 were below the age cutpoint and n = 29 were above, and therefore at significantly increased risk for obesity. Within age subgroups, 20.8% of younger Caucasian individuals were obese and 51.7% of Caucasian women over the age of 29.28y met BMI criteria for obesity. Among African American women, the age cutpoint was 36.18y, and n = 23 women were below and n = 22 women above the age cutpoint. A higher percentage of the subgroup above the threshold was obese (81.8%) compared with below the threshold (56.5%), but this was not statistically significant (χ^2 (2, n = 45) = 3.36; $p > .05$). None of the remaining variables predicted obesity in the subgroups as the sample sizes of subgroups was too small for subsequent data analysis.

Discussion

This study examined the factors associated with BMI and body fat in African American and Caucasian women using regression and signal detection methodologies. Results support a positive relationship between BMI, body fat percentage, and eating behaviors.

Cognitive restraint was associated with lower BMI and reduced body fat among both groups, consistent with previous studies [8, 32]. African American women reported similar levels of restraint over eating as Caucasian women, in contrast with previous research among community samples [10, 11]. We did not replicate Atlas *et al.*'s (2002) finding of slight but significantly lower restraint among African American compared to Caucasian college females. The nonconformity of present findings with previous African American samples may suggest that African American affective eaters in this sample

practice restraint over eating to a similar extent as some Caucasian populations. African American women in this sample had a mean restraint score of 12.6 (SD = 5.0), comparable to scores seen among Caucasian treatment-seeking overweight women (M = 12.6, SD = 3.8) [33] and Stunkard & Messick's original sample of Caucasian normal-weight dieters (M = 14.3, SD = 3.6) [21].

As hypothesized, BMI and body fat were significantly higher and self-reported disinhibition was significantly lower among African American compared to Caucasian women. Higher disinhibition was associated with greater BMI among both ethnic groups [8, 32], a finding that has been demonstrated in a variety of samples [40, 41], including obese (BMI > 32) [33], severely obese (BMI > 40) [37], nonobese (BMI < 28) [38], and premenopausal women [39].

In addition to reduced disinhibition, African American women in the sample also had significantly lower perceived hunger than Caucasian women. Findings parallel previous research indicating significantly reduced disinhibition and perceived hunger awareness among African American compared to Caucasian obese treatment-seeking multiethnic women [11]. The lower levels of disinhibition and perceived hunger reported by African American women may suggest that the relationship between disinhibition of control over eating and higher BMI is more pronounced among Caucasian women.

Findings further revealed that African American ethnicity was the most significant determinant of higher BMI and body fat after controlling for demographic variables and eating behaviors. Regression findings suggest that being African American is associated with a significantly higher BMI and body fat percentage than being Caucasian. This implies that even among samples of women who are susceptible to

abberant eating behaviors, such as affective eaters, disordered eating patterns are not factoring largely into the higher body weight of African American women. Ultimately, physiological, genetic, and cultural variables may play important roles in weight status, particularly among African American women.

Research describing African American women's reduced eating disorder pathology compared to Caucasian women may partially explain heavier body weight despite less disordered eating patterns among African American women in the present data [34, 35]. More African American women in the sample were obese, and had corresponding higher body fat percentage despite overall maintaining a healthier eating behavior profile than Caucasian women. Cultural differences between African American and Caucasian women in ideal weight standards and body image serve in part to explain behavioral differences in eating patterns between groups [12, 13]. Physiological differences between African American and Caucasian women, such as heightened insulin resistance among African Americans [42], additionally provide supplementary hypotheses as to why African American women may be genetically predisposed for metabolic abnormalities that set them up for overweight and obesity independent of aberrant eating patterns.

Signal detection results were consistent with regression findings, revealing that ethnicity was the primary factor in determining likelihood for obesity in the sample, followed by age for both ethnic groups. African Americans were at the greatest risk for being obese. Different ages at which risk for obesity increases were identified within each ethnic group, but age was only a significant risk factor for obesity among Caucasian women who were older than 29y. This is interesting because a high percentage of both

Caucasian and African American women who were above the identified age cutpoint were obese; however, a large proportion of women below the age cutpoint were obese only among the African American subgroup. While there is a universal need for obesity prevention among both Caucasian and African American women, data suggest a pressing need for early-onset weight management interventions among African American females.

The present study made two key contributions. The community sample of African American affective eaters increases the generalizability of results over studies utilizing primarily Caucasian samples. Additionally, the present findings expand on current knowledge about eating patterns of African American and Caucasian women. Findings may have clinical value as the present sample may reflect the type of clientele likely to seek weight loss treatment in the community. Limitations of the present study include the cross-sectional research design of the study. Although factors entered into the regression models are considered predictors of the outcome variables, it is not possible to determine causality between variables. Also, all participants were female, reported emotional eating, and were African American or Caucasian, potentially limiting sex and ethnic populations to which results can generalize.

In conclusion, data from this study provides preliminary support that African American female affective eaters maintain higher BMI and body fat percentages than their Caucasian counterparts independent of disordered eating patterns. Data in this context suggests the importance of physiological and cultural variables that play a role in the dramatic body weight disparities between African American and Caucasian women. Furthermore, our findings provide support for the use of SDA in obesity risk factor evaluation among diverse samples, revealing that African American ethnicity increases

the risk of obesity. High risk for obesity is present among African American women of all ages in the sample, whereas only a subset of older Caucasian women in the sample are at significantly increased risk for obesity. These findings encourage the use of SDA as a tool that can be applied to the study of factors associated with obesity prevention and treatment.

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Table 1. Characteristics of the Sample (N = 98)

	African American (n = 45)	Caucasian (n = 53)	F	df	p
	M (SD)	M (SD)			
Body Mass Index (kg/m^2)	33.9 (6.6)	30.5 (5.3)	7.94	1,96	.006**
Body fat percentage	42.4 (7.8)	38.2 (7.6)	7.27	1,96	.008**
Age (y)	37.0 (12.0)	35.0 (12.0)	.68	1,96	.412
Beck Depression Inventory	9.1 (8.5)	7.8 (9.1)	.44	1,88	.508
Emotional Eating Scale					
Anxiety Scale	9.6 (7.0)	11.9 (7.6)	2.29	1,95	.134
Depression Scale	7.9 (5.3)	10.4 (4.4)	6.29	1,93	.014*
Anger/Frustration Scale	11.3 (8.3)	13.3 (10.2)	1.06	1,91	.306
	% (N)	% (N)			
Marital status			2.84	1,95	.095
Single	62.2 (28)	52.8 (28)			
Married/Living Together	11.1 (5)	35.8 (19)			
Divorced/Separated	24.5 (11)	11.3 (6)			
Education			6.10	1,96	.015*
Some/all high school	11.1 (5)	3.8 (2)			
Some college	31.1 (14)	9.4 (5)			
Completed college	35.6 (16)	52.8 (28)			
Some/all graduate school	22.2 (10)	34.0 (18)			

Employment			.16	1,96	.690
Full time/homemaker	71.1 (32)	73.5 (39)			
Part time	20.0 (9)	11.3 (6)			
Unemployed	6.7 (3)	11.3 (6)			
Disability	2.2 (1)	---			
Retired	---	3.8 (2)			
Income			1.08	1,95	.302
Below 30	26.7 (12)	24.5 (13)			
30-50	28.9 (13)	24.5 (13)			
50-70	24.5 (11)	16.9 (9)			
Above 70	20.0 (9)	32.1 (17)			
Eating Disorder Diagnostic Scale			2.20	1,96	.141
No diagnoses	84.4 (38)	69.8 (37)			
Sub-threshold BN	4.4 (2)	11.3 (6)			
Full threshold BN	6.7 (3)	11.3 (6)			
Sub-threshold BED	2.2 (1)	1.9 (1)			
Full threshold BED	2.2 (1)	5.7 (3)			

Notes: * – p<.05; ** – p<.01; *** – p<.001; BN – Bulimia Nervosa; BED – Binge Eating Disorder

Table 2. Eating Inventory Factor Scores, by Ethnicity

	African American (n = 45)	Caucasian (n = 53)	F	df	p
	M (SD)	M (SD)			
Cognitive restraint	12.6 (5.0)	12.0 (5.2)	.26	1,93	.612
Disinhibition	8.2 (3.6)	10.9 (3.5)	14.64	1,96	.000***
Hunger awareness	5.5 (3.5)	7.6 (3.3)	9.31	1,94	.003**

Notes: * – p<.05; ** – p<.01; *** – p<.001

Table 3. Multiple Linear Regression Models of Body Mass Index and Body Fat

	B	β	SE	F or t	P
DV: Body Mass Index (kg/m^2); R^2 = .324; Adjusted R^2 = .211					
Overall model				2.877	.002**
Age (y)	.023	.054	.044	.431	.668
Restraint	-.305	.121	-.251	-2.511	.014*
Disinhibition	.558	.207	.340	2.700	.008**
Hunger	-.342	.219	-.190	-1.558	.123
AA Ethnicity	3.896	1.358	.312	2.868	.005**
[a]MarStat_MarCohab	-2.446	1.609	-.170	-1.520	.133
[b]Edu_High School	3.430	2.585	.146	1.327	.188
[c]Edu_College	2.841	1.402	.219	2.026	.046*
[d]Empl_Unemployed	2.951	1.939	.154	1.522	.132
Empl_Part-time	-1.395	1.824	-.081	-.765	.447
Income_30_50	1.851	1.768	.131	1.047	.298
Income_50_70	2.029	2.086	.135	.972	.334
Income_above70	.728	2.000	.052	.364	.717
DV: Body fat; R^2 = .360; Adjusted R^2 = .254					
Overall model				3.378	.000***
Age (y)	.177	.067	.263	2.639	.010**
Restraint	-.349	.150	-.226	-2.321	.023*

Disinhibition	.617	.256	.295	2.406	.018*
Hunger	-.413	.272	-.180	-1.518	.133
AA Ethnicity	4.754	1.684	.299	2.823	.006**
[a]MarStat_MarCohab	-2.423	1.996	-.132	-1.214	.228
[b]Edu_High School	2.474	3.205	.083	.772	.443
[c]Edu_College	2.904	1.739	.176	1.670	.099
[d]Empl_Unemployed	3.527	2.404	.144	1.467	.146
Empl_Part-time	-.385	2.262	-.017	-.170	.865
Income_30_50	2.864	2.192	.159	1.307	.195
Income_50_70	3.555	2.587	.185	1.374	.173
Income_above70	2.692	2.480	.151	1.085	.281

Notes: * – p<.05; ** – p<.01; *** – p<.001; AA – African American; [a]Married and living together compiled; [b]Some/all high school compiled; [c]Some/all college compiled; [d]Retired/Disability/unemployed compiled

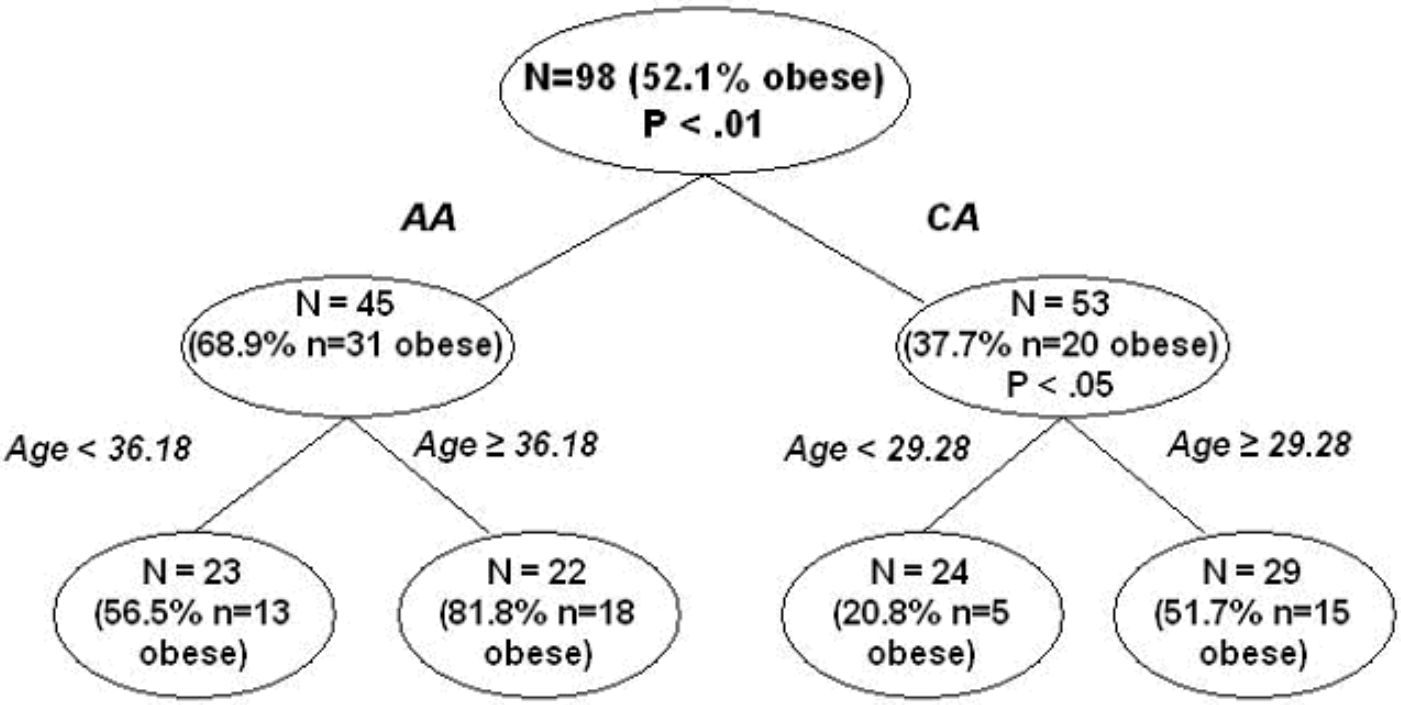

Figure 1. ROC Decision Tree for Subgroups at Risk for outcome of BMI ≥ 30